

ACTIVITY OF ANTISEPTIC SOLUTIONS IN RELATION TO THEIR PHYSICOCHEMICAL PROPERTIES

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ABSTRACT

Knowing antiseptic activity of chemical disinfectant substances has a great practical value in Predictive, Preventive and Personalised Medicine. It is evidential that there is the need for defining standard technique for quantitative determination of bactericidal activity of chemical disinfectant substances, as well as the need for defining parameter for comparing various chemical disinfectants. Solution of phenol (5%) was considered as referent standard for evaluation of efficacy of disinfectant aqueous solutions. Suitability of phenol coefficient for evaluation of nonphenolic disinfectants is still opened question. On the other side the methods for evaluation of antiseptic activity of disinfectant aqueous solutions are microbiological.

The aim of this study is to develop a new empirical coefficient which is capable to express the various physicochemical properties of disinfectant solutions on bactericidal activity. The basic duty of this parameter (Disinfection Activity Coefficient of Solution - DACS) is to express capability for comparison and prediction of disinfectant activity. The DACS index, which is the sum of four terms (fluidity, surface tension, redox potential and osmolality), results in good correlation with the activity at different disinfectant aqueous solutions. The DACS index can be calculated using additive and statistical models. Statistical model is adequate for evaluation of different disinfectant solutions because of better expressing the bactericidal activity then additive model. For analyze of various dilutions of one disinfectant there is no significant difference between this two models. The usefulness of DACS is demonstrated for analyze of bactericidal activities on different disinfectant solutions containing boric acid, chlorhexidine, chlorhexidine with cetrimide, chloroxylenol, chlorophen, eosin, hydrogen peroxide, phenyl mercury borate, povidon-iodine, thiomersal, tosilchloramide and phenol. Results for bactericidal activities obtained from microbiological tests on *Staphylococcus aureus* was compared with activities predicted with DACS. As the conclusion, it is considered good correlation between experimental and calculated values for bactericidal activity.

Key words: disinfectant, bactericidal activity, antiseptic